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Information for decision-making and participation

Report of the Secretary-General

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I. Introduction

1. Information and participation cut across all the other issues highlighted in Agenda 21. Without adequate and timely information and effective public participation, decision-making can be both haphazard and unconnected to people's needs. Chapter 40 of Agenda 21, on information for decision-making, highlighted two main issues: bridging the data gap within and between countries and improving the availability of and access to information. These issues are still highly relevant today, but the context within which they need to be addressed has changed considerably since 1992.

2. An international expert meeting on information for decision-making and participation was held in Ottawa from 25 to 28 September 2000, sponsored by the Government of Canada, the Department of Economic and Social Affairs and the United Nations Environment Programme (UNEP). This meeting considered many of the issues to be discussed by the Commission on Sustainable Development in its review of this topic. Some of the issues considered at that meeting are reflected in the present report. The full report of the meeting is before the Commission as a background document.

II. Changes since the United Nations Conference on Environment and Development

3. As the revolution in information technology has exploded into the "new knowledge economy", the importance of information has grown accordingly. The media often refer to a new information century. Although investments in information technology have sky-rocketed, there is often confusion about the value of information and knowledge. Unlike most goods, whose value depends on their relative scarcity, the real value of information for society grows the more it is shared and used. Restricting its distribution in an attempt to increase its value could be counterproductive from a societal point of view. As noted by the high-level panel of experts on information and communication technology, knowledge differs from other factors of production in that it expands when applied (see A/55/75-E/2000/55, para. 12). For instance, the more widely and freely information on soil erosion control is shared with local land users, the more erosion will be effectively controlled, with cumulative benefits for society. Information is a tool that makes other kinds of benefits and wealth generation possible. As stated by the panel the challenge of a knowledge-based economy is not a scarcity of knowledge but inadequacies in the means of diffusing and using it (see A/55/75-E/2000/55, para. 12). The issues of communication and access to information and of the content and use of information are different although interrelated. This distinction is important when it comes to considering information for decision-making and participation.

4. New information technologies are changing the ground rules for information flow in society. Previously, the holders of information decided how it should be distributed and to whom, and this control gave them power. Top-down systems of management and governance functioned on this basis. Information has traditionally been limited by the capabilities of the technologies available (printed word, telephone etc.) for its distribution. The mass media broadcasts information in an untargeted way for those who happen to be listening or watching, but this is still

limited in range and ephemeral in time. The Internet and computer-mediated information systems shift the balance of control from suppliers to consumers. Information holders simply make their information available on the Internet, and users can come searching for what interests them in a very flexible way. The pool of electronic information worldwide is growing exponentially, and information flow has become more horizontal. Anyone can become both a user and supplier. The potential being opened up by these new patterns of communication is revolutionary and still far from being appreciated adequately. For instance, such information systems empower users to make their own decisions, permitting more decentralized and locally adapted forms of management. One result is the rapid growth in non-governmental organizations and other new structures in civil society that expand the scope of public participation in decision-making.

5. Access to information is essential in the planning, design and monitoring of policies to support sustainable development at the regional, national and international levels. At the government level, a growing number of countries are carrying out national data inventories, organizing the collection and dissemination of data and developing information systems.

Box 1
Country initiatives

In Ghana, the objectives of the new environmental information network are to strengthen information-handling capacity in networking between participating institutions, and to improve on the delivery of information to the users of environmental information. Its activities include the creation of an information centre, where information is to be collected, databases established and information centres linked. Creating promotional print media on environmental issues and an electronic networking system in the environmental institutions has made information-gathering faster and enhanced capacity for data collection, storage, processing and dissemination. In Latin America, the Costa Rica Foundation for Sustainable Development has introduced small deployable information centres through a project entitled "Little intelligent communities". The centres comprise a high band-width satellite link, a space for telemedicine, an environmental monitoring capability, a computer lab and a walk-up information booth.

6. Another change is the continuing technical progress in environmental observing and monitoring systems. Satellite remote sensing with ever-more refined instruments and improved resolution and coverage, drifting buoys with autonomous instrument packages transmitting their measurements in real time, and more powerful computers allowing the increasing integration of data into complex models and decision-support systems, such as geographic information systems, are putting the world at our fingertips. The institutional capacity to coordinate all this is also growing through such initiatives as the Integrated Global Observing Strategy Partnership, global observing systems and global research programmes.

7. This rapid progress has increased concern for the widening gap, the so-called digital divide between the "haves" and "have nots" in the information revolution. The most obvious gap is due to the deficiencies in the coverage of technological and communications systems for transmitting information. Those parts of the world without the telecommunications infrastructure to connect into the new global systems, those parts of the population too poor to be able to afford the equipment necessary to connect to these systems, and those generations educated in the pre-computer era are being left behind despite efforts to reach out to them. However, the boundaries between the haves and the have-nots are shifting rapidly. Countries that have recognized the importance of being connected are giving priority to investments in the necessary infrastructure. Younger generations are adapting rapidly, taking naturally to technologies that still mystify their elders, while women in several countries are quickly closing the gender gap.

Box 2

Millennium Declaration and related actions

At the Millennium Summit, heads of State and Government resolved, inter alia, to ensure that the benefits of new technologies, especially information and communication technologies, in conformity with recommendations contained in the Ministerial Declaration adopted by the Economic and Social Council at the high-level segment of its substantive session of 2000, are available to all (see General Assembly resolution 55/2). In direct follow-up, the Secretary-General formed an advisory group of 21 experts from the private and public sectors to help bridge the digital divide by harnessing the potential of information and communications technologies for development.

8. The importance of closing the information gap is heightened by the potential of these new systems to give information access to and empower civil society groups and thus enhance their participation. They represent a potential breakthrough in the provision of public services, education and employment opportunities, particularly for women, young people and other groups. One can imagine new information-based occupations springing up through the combination of new technologies, microcredit and the educated unemployed. Developing this potential will require more robust and adapted technologies, improved information packaging and new marketing strategies. Specific policies are also needed to address the eradication of poverty in terms of the role that information and information technologies can play.

9. A second but continuing information gap since the United Nations Conference on Environment and Development (UNCED) concerns basic data about our environment and the pressures from human activities. Even in the industrialized countries, data are often too limited or too disparate to be usable. In developing countries, even the most basic statistics are often lacking. No assessment or decision-support system can deliver results better than the quality of the inputs. Even where new technologies are generating masses of data, the capacity to analyse and use it is often lagging behind.

10. Another change since UNCED has been the rapid shift in responsibilities and resources resulting from globalization, made possible by the ability to disperse economic activity geographically while linking it electronically.[1] Governments find themselves falling behind as the private sector and civil society organize and operate in new, more innovative ways. Major new issues concerning the control of the Internet and the privatization of information are being debated. The outcome of these debates for the use of information for decision-making will be significant.

11. It is within the context of these changes that specific information issues and proposed solutions need to be explored and developed during the Commission's discussion of these issues during its ninth session. The following sections review specific issues that have emerged or evolved since 1992.

III. Issues for discussion and policy recommendations

A. Bridging the data gap

12. Great differences exist between geographical regions and countries at different stages of development, as to the availability of relevant primary data (e.g., in the area of sustainable development), the quality, comparability and frequency of data compilation, and the quality of information systems. Even in the most developed regions, problems of non-uniform standards and methods for collecting data, dispersion of data among different agencies and the handling of information can make use of that information for management and regional comparisons difficult. The data gap exists even where data seem to be abundant, because so little of it is in forms that can be used for assessment and management purposes.

1. Development of indicators of sustainable development and their use

13. Significant progress has been made both internationally and nationally in the development of indicators as tools to support national decision-making processes. One example is the Commission's work programme on indicators of sustainable development, which represents the largest United Nations system-wide and country collaboration to date in the development of an indicator framework and methodology based on a consensus among the more than 30 participating agencies, other international organizations and Governments. To date, 22 countries have been involved in testing the indicators as the basis for an overall revision of the framework and methodologies in preparation for the Commission's ninth session.

14. Paragraph 40.7 of Agenda 21 calls for recommendations for a harmonized development of sustainable development indicators at the national, regional and global levels, and for incorporation of a suitable set of these indicators in common, regularly updated, and widely accessible reports and databases, for use at the international level, subject to national sovereignty considerations.

15. The goal of the Commission's work programme, which was approved by the Commission at its third session in 1995, is to make the indicators for sustainable development accessible to decision makers at the national level by defining them, elucidating their methodologies and providing training and other capacity-building activities, as relevant. Indicators, as used in national policies, may also be used in the national reports to the Commission and other intergovernmental bodies.

16. The outcome of the Commission's work programme on indicators of sustainable development is reviewed in an addendum to the present report (E/CN.17/2001/4/Add.1).[2] Two additional reports are being made available to the Commission as background documents, entitled: "Indicators of sustainable development: framework and methodologies" and "Initiatives for the aggregation of sustainable development indicators"; the present report and its addendum should be read in conjunction with these two background documents.

17. Other major initiatives include the work of the World Bank on genuine savings and measures of wealth indicators, the Organization for Economic Cooperation and Development/Development Assistance Committee/World Bank/United Nations programme on indicators for shaping the twenty-first century and the United Nations Development Programme (UNDP) work on the human development index, the United Nations Development Assistance Framework (UNDAF) common country assessment indicator framework, and the basic social services for all indicators, among others. These indicator efforts are providing important tools to support national decision-making processes.

2. Improved data collection and use

18. Major initiatives have been launched to improve environmental observations and data collection, ranging from ozone monitoring under the Montreal Protocol and implementation of the three global observing systems to non-governmental organizations monitoring forests and coral reefs. There have also been efforts to improve coordination and cost-effectiveness, such as through the integrated global observing strategy. However, these efforts are badly under-funded relative to the need for improved data in response to global data needs, such as the requirements of multilateral environmental agreements. Several other problems are also evident and need further attention.

Harmonization and rationalization

19. Growing recognition of the need for information-based decision-making is driving a steady increase in reporting requirements at all levels. As Governments struggle to meet their reporting obligations, for example, under international conventions, they recognize the need for harmonization and rationalization of reporting requirements. Efforts are under way in the Economic and Social Council and elsewhere to standardize development data and indicators in an attempt to address the growing number of data requirements of United Nations-system programme activities. The United Nations Statistics Division has undertaken a major study on the needs for harmonization and rationalization in the context of integrated and coordinated implementation and follow-up of major United Nations conferences and summits (E/1999/11). The report notes, inter alia, that among international organizations there is ample room for improvement in the coordination of data collection. Such coordination can promote efficient use of resources and contribute to easing the burden on countries' statistical programmes. It also documents many inconsistencies among data disseminated at the international level. At the same time, there is a lack of basic statistical data at the country level and an urgent need to build and enhance national statistical capacity. Improved coordination at the international level regarding data collection and standardization of concepts and methods with regard to indicators will go a long way towards addressing some of the inconsistencies. The UNEP Global Environment Monitoring System water

operations manual, used by many countries, is an example of how multinational standardization can assist in the development of monitoring programmes, although these protocols need further expansion and development to become truly effective tools.

Integration of information

20. Even where the data exist, there are often difficulties in obtaining and combining data from different ministries for an integrated view of sustainable development. There is first an institutional problem with data holders (ministries, companies in the private sector, scientists etc.) not wanting to share their data with other users for various reasons. This type of problem may be amenable to improvement through policy changes and institutional reform. Then there are technical problems in combining economic, social, and environmental data and indicators measured in different units that are not easily compared, as well as problems in combining data at different geographic scales (local, national, regional, global). Research on solutions to these problems has made some progress but needs further encouragement and support.

Box 3
Institutional initiatives

Countries are addressing institutional problems through a variety of means. Towards the end of 1994, Tunisia established a national observatory for environment and sustainable development with the purpose of collecting and providing public officials with continuous data and information regarding the environment, including through the use of such tools as indicators of sustainable development. Tunisia also established a national network on sustainable development that allows users and suppliers of relevant sustainable development information to communicate electronically. Belgium passed national legislation in May 1997 that established an interdepartmental commission on sustainable development that is charged with preparing a federal level sustainable development plan every four years. The Commission facilitates the exchange and coordination of sustainable development information among its members at various administrative levels, including regional and local levels.

21. While technological progress has driven improvements in remote sensing and information access over the Internet, the ability to analyse and assess data and to assemble information in a comprehensive integrated framework has lagged behind. There is an ongoing need to consider weaknesses in the whole data collection, analysis, assessment and reporting process and recommend necessary improvements to eliminate bottlenecks in the information system. Even in the most developed and data-rich regions, such as Europe, the regional integration and assessment of data has been hampered by inconsistent methodologies and inadequate harmonization.

Innovative data collection

22. While scientific research has been the customary supplier of sustainable development information, its coverage is too thin and the scientific infrastructure too weak in many countries to meet the essential needs for environmental management. There have been some successes in bottom-up approaches to data collection, using school children, non-governmental organizations, major groups and amateur volunteers, that can help to fill in data gaps. This may be a partial solution to the particular problems of data collection in developing countries but cannot substitute for efforts to strengthen the scientific research capability to produce better data.

23. Progress can be reported in the production of more integrated and forward-looking assessments of environment and sustainable development, including the *Critical Trends* report prepared for the five-year review of UNCED in 1997, the UNEP *Global Environment Outlook* reports and the UNEP/World Resources Institute/United Nations/World Bank *World Resources Reports*, which provide data for 157 countries on environmental resources, consumption and waste, as well as new information on poverty and food security. However, these reports suffer from the lack of adequate core data sets at the international level for many topics, limiting the conclusions that can be drawn from the available information.

Problems in methods of data assessment and analysis

24. This shift in demand from sustainable development data to more explicit and policy-oriented assessments is exemplified in the development of UNEP's global environment outlook network and reports. As noted, the shift towards assessments does not remove problems with the underlying data. In fact, the work on global assessments has revealed weaknesses in the data foundation, particularly when it comes to monitoring progress over time.

25. One continuing problem is that many of the data sets are needed by not one but many different organizations. Consequently, responsibilities for this largely common basis of data are often unclear. Other problems include the fact that primary data collection is costly and time-consuming to organize or modify and the pathway from the source to the user is often long, with the effect that by the time data are used in global or regional assessments, national experts view them as obsolete.

26. Data work for global environment outlook assessments, for example, has been a reminder that up to three quarters of the data required are non-environmental data. In addition, a straight compilation of country data for 150 key variables from the customary international sources proved to be unusable because of inconsistencies, errors and incompatibility between global sets and nationally acknowledged data. Finally, as impacts on specific groups and ecosystems are getting more attention, requiring analysis at various scales, spatially defined information is becoming more in demand.

3. Strengthening the capacity for traditional information

27. Chapter 40 of Agenda 21 addresses the need to consider traditional knowledge — knowledge that reflects the long practical experience of indigenous and local cultures in the conservation and sustainable use of resources. The knowledge and wisdom of indigenous and local communities is critical to the

conservation and management of much of the world's biological diversity and natural resources and can add value to contemporary, scientific ways of thinking. Current understandings may be incomplete if traditional knowledge is not taken into account.[3] Documenting and preserving the use of traditional knowledge at the community level and using this knowledge to address resource management issues are particularly important undertakings in the implementation of both the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, and the Convention on Biological Diversity, as well as Agenda 21 itself.

28. The Conference of the Parties to the Convention on Biological Diversity have taken a number of decisions and adopted a programme of work which, inter alia, examines the application and development of legal and other appropriate forms of protection for the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles. A major step forward in the process of increasing indigenous and local community participation in the work of the Convention is the establishment of the Ad Hoc Open-ended Inter-sessional Working Group on the Implementation of Article 8 (j) and Related Provisions. The Conference of the Parties to the Convention has requested the Working Group to develop guidelines for the increased participation of indigenous and local communities in the work of the Convention.

29. The secretariat of the Convention to Combat Desertification has compiled regional and subregional reports on the most important and widely applied examples of traditional knowledge. An ad hoc panel of experts was appointed by the Conference of the Parties to the Convention to identify successful experiences in traditional knowledge, to review specific case histories for integrating traditional and local knowledge into modern knowledge, and to propose mechanisms for promoting and exchanging successful approaches. The report of the panel was presented to the Conference of the Parties to the Convention at its third session, in November 1999 (see ICCD/COP(3)/CST/3 and CST/3/Add.2). Given the importance placed on traditional knowledge by the Conference of the Parties to the Convention, the ad hoc panel was reappointed and requested to develop further appropriate criteria in line with future work on benchmarks and indicators, to be used by national focal points.

B. Improving the availability of and access to information

1. Making information useful for decision-making

30. New avenues are opening for preparing and presenting information in formats more easily understood by decision makers and the general public. Multimedia technologies, software packages, and such tools as indicators and animated graphical presentations can assist decision makers in their sustainable development efforts. The development and use of geographic information systems (GIS) and map-based information tools have expanded rapidly in recent years. They provide helpful planning tools allowing for visual assessment of impacts and of resources available to address problems and environmental emergencies. One example of the expansion of such information tools for practical applications are the products of the Global Resource Information Database, part of UNEP's environmental information network. Another example is the International Centre for Tropical Agriculture/World

Bank/UNEP *Spatial Planning Atlas* available on CD-ROM for the Latin American and Caribbean region. The Food and Agriculture Organization of the United Nations (FAO) Advanced Real Time Environmental Monitoring Information System, supports the operational monitoring of seasonal growing conditions and vegetation development worldwide.

2. Public access

31. A major new issue since UNCED is the need to facilitate public access to environmental information, as exemplified by the adoption in 1998 of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. The Convention aims to provide public and non-governmental organizations in Economic Commission for Europe countries with common tools and standards to monitor performance and engage in environmental decisions on issues ranging from nuclear power to infrastructure development. The Convention has three main components. The first sets rules and requirements for Governments to disclose environmental and other information to the public. The second addresses how public and private interest groups can participate in environmental decision-making. The third deals with the right of public and private interest groups to seek judicial remedy for non-compliance by Governments and corporations.[4] A key question is whether conventions of this nature are or should be made applicable in other national or regional settings.

32. Recent experience has shown that public awareness of the environment, access to local environmental data and participation in the debate on environmental quality are critical to environmental improvement. The UNEP Global Environmental Information Exchange Network (INFOTERRA), with national focal points in most countries, is being reformed to ensure better public access to environmental information and to advocate the public right to know principle.

3. Reaching the excluded

33. Special efforts are needed to make electronic sustainable development information as widely available as possible and in all segments of society, since decision-making on sustainable development takes place at all levels, from intergovernmental meetings to individual resource users in rural areas.

34. High priority needs to be given to broad-based, grass-roots approaches aimed at involving civil society, particularly women, youth and older persons as a means to secure their input into sustainable development issues. Working with women, youth and other civil society groups active in sustainable development to facilitate investments in innovative information and communications technologies represents an important opportunity for the further empowerment of these non-governmental actors. The ability to communicate their perspectives and concerns is a central empowerment issue, both for publication of their views and for access to information and education that will promote consciousness-raising for women and others. The decentralized, interactive and non-hierarchical nature of new information technologies provides a unique space for women and youth to develop their views, opinions and benefit from the synergy of interactive communications with their counterparts nationally and internationally. In addition, once the initial costs of access and technology are covered, the Internet and other information technologies present a low-cost and relatively simple mode of publishing

newsletters, articles, statements etc. Special attention should be given to involving women and youth in training and support, in partnership with technology providers.

Box 4
Learning networks for African teachers

The United Nations Educational, Scientific and Cultural Organization, through its project on harnessing information technology for development in Africa, is working to improve basic education in Africa through the development of a network connecting African teacher training colleges and educational authorities to the Internet. The programme seeks to upgrade the capacity of teacher trainers, develop educational resources in college libraries and initiate pilot experiences on technology based learning in the surrounding schools.

35. Another dimension of this topic is language. Language continues to be a barrier to the wider dissemination of information and its greater accessibility. The best data-transmission mechanisms will not serve their purposes if the vast majority of information and knowledge circulating in the world is in only a limited number of languages, with English being the most predominant. Even in the context of international governance, multilingualism is often perceived as an additional burden that slows down global negotiations and leads to additional costs for translation and interpretation. In this regard, the Ministerial Declaration on the Role of Information Technology noted that the development of local content on the Internet and the ability of people to freely access it will help to foster a culturally and linguistically diverse cyberspace and encourage broad and sustainable use of the Internet.[5]

4. Training the users

36. As scientific information on the environment and sustainable development has become more widely accessible, it has become apparent that additional efforts are needed to integrate and use available information in decision-making processes, at all levels, in a timely and appropriate fashion. Data may need to be analysed, interpreted and presented in understandable ways, but the capacity to do this has not kept up with space technologies and other means of generating new data. Fortunately, new techniques for generating maps, graphics, animated presentations and other formats can facilitate the communication of information on complex issues. However, even when it is delivered, many decision makers are unaccustomed to using scientific information, emphasizing the need for special training activities on the use of information for decision-making.

5. Making use of commercial information sources and business involvement

37. Chapter 40 of Agenda 21 refers particularly to commercial information sources and information available in the private sector, and this area has seen significant developments since 1992. As more companies around the world adopt standards and systems for environmental management — such as ISO 14001 — and social and accountability standards — such as AA 1000 and SA 8000 — more reliable and comparable environmental, social and economic performance information is being

generated and is often voluntarily published as part of corporate environment and/or sustainability reports. A growing community of users of this information is emerging, including ethical investment firms, benchmarking and rating organizations, NGOs, and environmental and social reporting award schemes launched in a number of countries.

Box 5
Government/private-sector initiatives

The microlevel information generated by companies needs to be linked to macrolevel policy concerns and targets set by Governments. This is beginning to happen, as demonstrated in recent initiatives, including: (a) the work of the Division for Sustainable Development of the United Nations Secretariat and an expert working group on improving the role of Governments in the promotion of environmental management accounting; (b) the UNEP global reporting initiative to establish a common framework for enterprise-level reporting on the linked aspects of environmental, economic and social sustainability; (c) the United Nations Conference on Trade and Development Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting; and (d) the "Engaging stakeholders programme" of UNEP, in cooperation with SustainAbility Ltd. These initiatives provide an opportunity for Governments to work closely with the private sector to ensure that the sustainability performance information generated by the private sector is utilized for useful planning and monitoring tools.

38. Due to changing budget priorities, changes in perceptions about the role of government and rapid advances in information technology, there is a growing trend towards the commercialization of information previously held in the public domain and/or the migration of such information from the public domain to commercial systems whose costs may make information unaffordable for many users. For example:

(a) In response to growing commercialization of meteorological information, in 1999 the World Meteorological Organization adopted a resolution distinguishing between "basic" and "special" (commercial) information. Basic information is defined here as information that should remain in the public domain, while special information can be commercialized;

(b) The European Union (EU) recently passed legislation on intellectual property rights that permits the commercialization or transfer to limited access of information that was until recently held in the public domain;

(c) The United States Congress is discussing incentives for commercialization of information. It is expected that such incentives may put all satellite information in the private sector;

(d) Also in the United States, policy changes have already resulted in the commercialization of information and data previously held by federal or national agencies. For instance, the former Office of Technical Assessment, which served the

United States Congress, has been eliminated and is now functioning as a consulting company;

(e) The former research and information arm of the Federal Environmental Agency in Austria has been privatized and is shifting to a commercial mode of operation.

39. This trend has two immediate impacts: (a) it affects access to information by the public in the countries where these trends occur, and (b) it limits access of other countries and the global community to information relevant to sustainable development or the livelihoods of groups in other countries or for the global good. Policy guidance is needed to distinguish between information uses that can effectively be commercialized and those that should be freely available in the public interest.

6. Financial support for information infrastructure and critical data-collection efforts

40. At the same time that new possibilities are being opened up by new technologies, there is a decline in essential observations due to reductions in government support and spending. There is also a need to shift from data collection in research programmes to operational systematic observing programmes and institutions able to provide both the long-term time series needed to monitor and assess global change, and information delivered rapidly for immediate use in decision-making. The particular problems of data collection in developing countries, which cannot afford the considerable costs when faced with other urgent priorities, may require innovative solutions, such as international support for the incremental costs of collecting data primarily for international assessments. The Commission should aim to enhance awareness in Governments of the need to increase financial support for critical data-collection efforts, both nationally and internationally. It is particularly important that the needs of policy makers for information and data are clearly understood by them and linked with the data-collection efforts of statistical offices so that the resources invested in information and data programmes clearly support policy objectives.

41. Adequate funding is also needed to support gender-sensitive research and information on decision-making on sustainable development. Efforts need to be made to provide funding for creative partnerships between government, women's groups and universities active on gender and sustainable development for comprehensive strategies for research development and dissemination. Additional gender-sensitive research at the international level needs to be enhanced. For example, comprehensive international analysis of policies for women's access to information about land and efforts to reform land legislation would be particularly useful, including innovative methods of improving information and understanding of related legal texts and provisions.

C. New information technologies

42. New information technologies are opening up exciting possibilities for innovative integrated environmental information systems using data globally from a variety of sensors and systems, transmitting it rapidly to assessment centres and generating targeted information products for delivery to decision makers, much as

the world weather forecasting system works today. However, the new flood of information from remote-sensing and other instruments is not being matched by a similar investment in the on-site collection of corroborating data and in the capacity to assess and add value to that information. Despite all the wonders of automation and artificial intelligence, there is still an important role for well trained minds and mature experience, requiring an investment in people as well as technologies as an integral part of an effective information system.

1. Space-based and remote sensing technologies

43. Earth observation from space is one of the most cost-effective means for understanding the Earth and its various scientific uncertainties. Such observations can provide the long-term consistent measurements of key physical variables needed to study the shifts in the state and variability of Earth's eco-system as a basis for rational action at the local level. Satellite remote sensing provides vital information on environmental impacts, natural resources and inputs for integrated development plans for both rural and urban settings. Satellites can provide communication connectivity to remote villages, including meteorological information and education services for poor communities. The advent of more than 230 instruments in over 70 satellite missions in the next 10 to 15 years, with sensors providing a wide variety of data, provides an opportunity for scientists to understand the complex interactions between various components of the non-linear, coupled Earth system.

44. The Integrated Global Observing Strategy links space-based observations with ground-based observations. Enabling technologies, such as GIS, satellite positioning systems, photogrammetry, artificial intelligence and neural networks, are enriching the satellite-based information systems to provide services to user communities. The FAO Global Information and Early Warning System uses integrated socio-economic and statistical data in combination with remote-sensing and other environmental information to monitor the food situation at regional, national and international levels, to alert the international community to impending food shortages. The seamless integration of satellite-based services on the World Wide Web, along with other conventional services, can provide information to users in a format and style more understandable to them.

45. In addition, applications of satellite communications technology for sustainable development use its ability to connect rural and remote locations, reaching areas impossible or expensive to connect with wire networks. Satellite communications can be used to provide much of the information needed in remote areas, such as:

(a) Health care (tele-medicine): satellite communications could help to expand access to health-care professionals throughout the developing world, and have been used in emergency situations;

(b) Distance education (tele-education) applications, such as two-way interactive video conferencing, including over the Internet, allow educational centres and research professionals to access data and information on a wide range of subjects;

(c) Warnings of bad weather and natural disasters to remote areas and ships: satellite telecommunications offer increased reliability compared to the standard terrestrial maritime communications facilities that were used in the past;

(d) Disaster response: after a natural disaster, satellite communications can be used to coordinate response efforts and can provide on-the-ground reports to decision makers, complementing information from remote-sensing satellites and other sources.

46. However, with all of these technologies there is an urgent need for appropriate human resource development and for scientists from different disciplines to work together to understand and implement the scientific solutions needed to ensure sustainable development.

2. Electronic networking

47. Electronic connectivity is increasing rapidly in all regions of the world. In the United States, it is estimated that the number of households connected to the Internet increased from 14.9 million in 1995 to 46.5 million at the beginning of 2000, and this number will more than double in the next five years. Taking business access into account, it is anticipated that there will be 171 million Internet users in the United States by 2004.[6] Significantly, it is projected that at least half of these users will be women. In Western Europe, Internet subscribers increased by 75 per cent in 1999 to 34.5 million, while Internet users increased 69 per cent to 64.3 million people.[7] Asia and Pacific Internet use has grown rapidly and is expected to reach 130 million by 2005. Much of this new growth will be fuelled by China, whose annual rate of Internet growth over the next five years is expected to reach 60 per cent or some 33 million users.[8] In Latin America, the number of Internet users is expected to triple over the next three years, increasing from 8.5 million today to 24.3 million by 2003.[9] In Africa, the Internet has grown rapidly in the last few years. At the end of 1996, only 11 African countries had Internet access; by September 2000, all countries except one had achieved permanent connectivity. Despite the rapid growth in the Internet, access in Africa has been confined largely to the capital cities, although 16 countries have Internet access in some of the secondary towns. It is difficult to calculate the actual number of Internet users in Africa, but there are more than 1 million dial-up subscriber accounts, with about 200,000 in North Africa, 650,000 in South Africa and about 150,000 in the remaining 50 African countries. According to Economic Commission for Africa (ECA) estimates, each subscription carries, on average, about 3 users, putting total users at about three million, with about 1 million outside South Africa. This works out to about 1 Internet user per 250 people, compared to a world average of one user per 35 people. The ratio in other regions is: North America and Europe, 1 in 3; Latin America and the Caribbean, 1 in 125; South East Asia and the Pacific, 1 in 200; East Asia, 1 in 250; Arab States, 1 in 500 and South Asia, 1 in 2,500.[10]

48. Due to these rapid technological improvements in computing and telecommunications and the number of Internet users, electronic access to data has significantly improved, with such tools as web-based meta-databases and Government and organization home pages providing direct links to data sources. Problems of non-uniform standards and methods for handling information are being overcome, although new problems of intellectual property rights to data and information are arising. One example of improved electronic networking is the United Nations system-wide web site on national implementation of the UNCED commitments. This site provides links to both international sites and government-hosted sites containing country information on sustainable development. In this context, the United Nations Statistics Division launched a meta-database of United

Nations system development data accessible on the Internet. UNEP is also planning an environmental information meta-system. In a strategic partnership with the Global Environment Facility, UNEP is initiating the Sustainable Technologies Alternatives Network, which will seek to improve knowledge management and information-sharing for environmentally sound decision-making and implementation of multilateral environmental agreements.

IV. Conclusions

49. Chapter 40 of Agenda 21 lays the foundation for transition to the new knowledge-based economy of the twenty-first century. This new knowledge economy has the potential to enhance individual skills, facilitate greater resource efficiency and promote technological advances to help reduce the gap between developed and developing countries and between rich and poor. The new knowledge economy presents us with both an opportunity and a challenge. We can take advantage of this opportunity only if we increase our investment in human beings, recognize the value of diverse views and appreciate the power of stakeholder participation. We can meet the challenge by building information infrastructures, adopting conducive policy and regulatory frameworks, fostering a positive business climate with improved services and financing, and generally supporting measures to ensure that people everywhere can benefit from the information revolution. Greater access to information and wider public participation in the use of information can be a force that unites rather than divides us.

50. As we look ahead, we have two main challenges: one is to create a more level playing field for decision makers around the globe; the second is to understand the full potential of new technologies.

51. With respect to the first challenge, greater attention must be given to strengthening decision-making in all countries by improving data collection, standardization, access and participation by civil society groups, including women and youth. Countries must be assisted with both technical and financial resources, as required, for this purpose. We have a responsibility to ensure that information technologies are used to narrow the gap between developed and developing countries and between those currently included in the new knowledge economy and those not yet taking part.

52. The second challenge is learning how to structure information for new uses and new users that have — and will have — access to information through new communications technologies. Our minds are still too conditioned by the printed page and the linear timeline of a film or tape to appreciate what the new freedom of flexible access makes possible. This is a challenge to all information providers, including Governments, the United Nations system, the private sector, NGOs and individuals. We need to assemble useful information on sustainable development in more comprehensive integrated frameworks that allow multiple points of access and that respond to the needs of many users. These evolving information systems will need to balance and combine the entrepreneurial possibilities to sell information and to finance the information systems themselves with the collective benefits from wide and free access to information. The underlying imperative is to guide policy-making in more sustainable directions.

V. Recommendations

53. Recommendations on the three key issues covered in the present report are set out below.

A. Bridging the data gap

54. The Commission may wish to:

(a) Recognize the important role that testing countries have played and the contribution they have made in finalizing a core set of indicators of sustainable development organized by themes and sub-themes under the Commission's work programme on indicators of sustainable development;

(b) Endorse the core set of indicators thus developed as a valuable starting point for countries that may wish to organize and elaborate their own national programmes for the testing, development and use of national level indicators of sustainable development;

(c) Continue its work programme on indicators of sustainable development, giving particular attention in the next phase to assisting developing countries and countries with economies in transition that may wish to develop a national indicators programme with technical information, advice and capacity-building support, and advance further work on modalities for the linkage and aggregation of indicators, building on and cooperating with existing research and development efforts;

(d) Encourage countries to make better use of indicators, indices and other statistical measures appropriate to specific national conditions and priorities, and to more closely monitor and report on progress being made at the national, regional and local levels towards defining and achieving national goals for sustainable development.

55. The Commission may wish to urge that:

(a) Public participation be promoted and facilitated as an important tool for improving the quality of data and in sustaining the political will needed to support a strong information infrastructure;

(b) A directory of meta-data repositories be established at various administrative levels containing easily available data compiled in ways that are usable by policy makers;

(c) The role of the private sector, NGOs and other major groups, particularly women and youth, in data analysis and reporting, be taken more fully into account in national information systems.

56. The Commission may wish to call on Governments and/or international organizations to:

(a) Work together, at the national and international level, to address technical differences in methods, reporting periods, data collection and aggregation, and in this regard, stress the importance of using common methodologies for data and indicators of sustainable development (e.g., standardized methodology sheets);

(b) Mainstream sustainable development data and information procedures and services by institutionalizing and strengthening integrated geo-spatial information systems for collecting, analysing and value-added processing of information for policy makers and other user groups;

(c) Make greater use of spatial information systems to combine and integrate economic, social and environmental information. Use of data at different geographical scales would be improved by geo-coding of such data;

(d) Develop strategic partnerships with non-governmental organizations, particularly women's and youth groups, as well as the private sector, to stimulate innovative data-generation and data-collection methods;

(e) Provide support and or funding to indigenous and local communities, as appropriate, to assist them in managing their traditional knowledge and resources more effectively.

57. The Commission may wish to request international organizations to:

(a) Streamline international data collection by building on existing efforts in harmonization of indicators, methodologies and data standards and recognizing the important role that the Statistical Commission can play in this regard;

(b) Develop a common framework for identifying those core data sets and information that are critical for the implementation of sustainable development and related multilateral agreements.

B. Improving the availability of and access to information

58. The Commission may wish to call upon Governments to:

(a) Make a high-level commitment to the need to establish national integrated information systems for decision-making for sustainable development and clearly identify the national units or agencies that have lead responsibility for coordinating and/or compiling data;

(b) Ensure that the needs of policy makers for information and data are clearly articulated by them and linked with the data-collection efforts of statistical offices so that the resources invested in information and data programmes clearly support policy objectives;

(c) Develop multimedia and, as appropriate, multilingual communication strategies to promote wider public access to information. Such strategies should encompass all types of communication tools, from traditional and non-formal to advanced modern technologies, and should operate at all levels from local to global;

(d) Facilitate public access to sources of relevant sustainable development data and information by supporting the development of appropriate institutional and regulatory frameworks for data gathering, sharing, diffusion and use of information, including the review of existing rules, modalities and protocols, with the aim of making information more accessible to all citizens;

(e) Encourage the development and establishment of a minimum set of common benchmarks for disclosure policies and/or practices by public agencies;

(f) Ensure that public access to information is maintained by discouraging and/or regulating, as appropriate, the migration of public or publicly held information into limited access commercial information systems;

(g) Identify innovative approaches, including making more efficient use of existing infrastructure, to provide local solutions for mobilizing financial resources for effective implementation of information objectives for sustainable development.

59. The Commission may wish to call upon Governments and/or international organizations to:

(a) Develop needed infrastructure and implementing capacity-building programmes that reach out to segments of society that are currently excluded from the information revolution, giving particular attention to women, youth, older persons and the poor as a means to ensure wider participation in the rapidly expanding information-based knowledge economy. In this context, the Ministerial Declaration adopted by the Economic and Social Council at the high-level segment of its substantive session of 2000 recommended the establishment of community information centres to ensure access to lower income and other currently excluded groups;[11]

(b) Encourage the wider use of multilingual information sources through, inter alia, terminology work in all languages to facilitate better understanding of sustainable development concepts and issues, including a thesaurus or glossary programme in United Nations languages that defines the terms used in the context of various international negotiations and multilateral agreements on sustainable development;

(c) Promote strategic partnerships between Government agencies, civil society groups, multilateral organizations and the private sector to mobilize political and financial support for national information infrastructures within which sustainable development information systems can be developed and improved through wide participation.

60. The Commission may wish to urge bilateral and multilateral donors to: ensure that development assistance includes building information capacity for sustainable development at the national level.

C. New information technologies

61. The Commission may wish to call on international organizations to:

(a) Cooperate to (i) provide cost-effective access to space technology inputs for sustainable development, and (ii) help with capacity-building in developing countries to interpret, analyse and integrate satellite-based information into operational applications;

(b) Promote the networking of decentralized data repositories applicable to, inter alia, distance education, tele-medicine, natural resource accounting and weather and climate forecasting, agricultural development, environmental and natural resource management, poverty alleviation and sustainable development planning.

62. The Commission may wish to request Governments, international organizations, civil society groups and business groups to:

(a) Establish strategic partnerships for the formulation and implementation of forward-looking strategies for the development and networking of Internet-based information systems, including the provision of advice, technical and other forms of assistance in such undertakings;

(b) Support initiatives to introduce, develop and implement multilingual and multi-dialect capabilities and local content in Internet-based systems so as to ensure the widest dissemination of information, in particular to those groups currently excluded.

Notes

[1] Michael Hart, "The social dimension of freer trade and globalization", *World Economic Affairs* (summer 1996).

[2] A set of indicators for sustainable consumption and production have also been developed in accordance with decision 7/2 of the Commission; a background document providing a status report on this work is before the Commission.

[3] See "Recommendation on the integration of two ways of knowing: traditional indigenous knowledge and scientific knowledge", paper presented at a seminar on the documentation and application of indigenous knowledge, Inuvik, Northwest Territories, Canada, 15-17 November 1996.

[4] See Elena Petkova and Peter Veit, "Environmental accountability beyond the nation-state: the implications of the Aarhus convention", *Environmental Governance Notes* (World Resources Institute, April 2000).

[5] See *Official Records of the General Assembly, Fifty-fifth Session, Supplement No. 3* (A/55/3), chap. III, para. 17, "para. 10".

[6] See Strategis Group, *Cyber Atlas: The Web Marketer's Guide to Online Facts* (February 2000).

[7] See *Cyber Atlas: Hardware — More ISPs for Western Europe* (2000).

[8] Estimates of the Strategis Group, June 1999.

[9] See *Chicago Tribune*, "Dot-Coms Flourish in Latin America", November 2000.

[10] See Mike Jansen, "African Internet status, ICT developments, policies and strategy: African Internet", accessed at *sn.apc.org* in September 2000.

[11] See *Official Records of the General Assembly, Fifty-fifth Session, Supplement No. 3* (A/55/3), chap. III, para. 17, "para. 8".

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Report of the Secretary-General

Addendum

Commission on Sustainable Development work programme on indicators of sustainable development

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I. Introduction

1. Indicators perform many functions. They can simplify, clarify and make aggregated information available to policy makers that can lead to better decisions and more effective actions. They can help to incorporate physical and social science knowledge into decision-making and they can help to measure and calibrate progress towards sustainable development goals. They can provide an early warning, sounding the alarm in time to prevent economic, social and environmental damage. They are also important tools to communicate ideas, thoughts and values because, as one authority has noted, "We measure what we value and value what we measure".

2. The United Nations Conference on Environment and Development (UNCED) recognized the important role that indicators could play in helping countries to make informed decisions concerning sustainable development. This recognition is articulated in chapter 40 of Agenda 21, which calls on countries at the national level, as well as international, governmental and non-governmental organizations, to develop and identify indicators of sustainable development that can provide a solid basis for decision-making at all levels. Moreover, Agenda 21 specifically calls for the harmonization of efforts to develop sustainable development indicators at the national, regional and global levels, including the incorporation of a suitable set of these indicators in common, regularly updated and widely accessible reports and databases.

3. The present addendum presents the steps taken to finalize a core set of indicators of sustainable development as a supplement to the main report on chapter 40 (Information for decision-making and participation). In addition to the information provided in the present addendum, two additional reports are being made available to the Commission as background documents, entitled "Indicators of sustainable development: framework and methodologies" and "Initiatives for the aggregation of sustainable development indicators".

II. Commission on Sustainable Development work programme on indicators of sustainable development (1996-2000)

A. Mandate of the Commission

4. At its third session, in 1995, the Commission on Sustainable Development approved the programme of work on indicators of sustainable development (E/CN.17/1995/18, annex) and called upon the organizations of the United Nations system, intergovernmental and non-governmental organizations, with the coordination of its secretariat, to implement the key elements of the work programme.

5. The main objective of the work programme was to make indicators of sustainable development accessible to decision makers at the national level, by defining them, elucidating their methodologies and providing training and other capacity-building activities. At the same time, it was foreseen that indicators as used in national policies could be used in the national reports to the Commission and other intergovernmental bodies.

B. Key elements of the work programme

6. The work programme comprised the following key elements:

(a) Enhancement of information exchange among all interested actors on research, methodological and practical activities associated with indicators of sustainable development, including the establishment of a freely accessible database (1995-continuing);

(b) Development of methodology sheets, which would describe for each of the indicators its policy relevance, underlying methodology, data availability assessment and sources, to be made available to Governments (1995-1996);

(c) Training and capacity-building at the regional and national levels in the use of the indicators for monitoring progress towards sustainable development (1995-1998);

(d) Testing of an appropriate combination of indicators and monitoring of experiences in a few countries to gain experience, assess applicability and

further develop the indicators for sustainable development (1996-1998);

(e) Evaluation of the indicators and adjustment, as necessary (2000);

(f) Identification and assessment of linkages among the economic, social, institutional and environmental elements of sustainable development to further facilitate decision-making at all levels (2000);

(g) Development of highly aggregated indicators, involving experts from the areas of economics, the social sciences and the physical sciences and policy makers, as well as incorporating non-governmental organization and indigenous views (2000).

C. Criteria for the selection of indicators

7. Indicators were selected and developed in accordance with the following criteria:

- Primarily national in scale and scope;
- Relevant to the main objective of assessing progress towards sustainable development;
- Understandable, that is to say, clear, simple and unambiguous, to the extent possible;
- Conceptually sound;
- Within the capabilities of national Governments to develop;
- Limited in number, remaining open-ended and adaptable to future developments;
- Broad in coverage of Agenda 21 and sustainable development;
- Representative of international consensus, to the extent possible;
- Dependent on data that are readily available or available at a reasonable cost, adequately documented, of known quality and updated at regular intervals.

8. Based on these criteria, 134 indicators were selected to comprise an initial core set or "menu" of indicators from which countries could select in developing their own indicators programmes. These indicators were organized in a driving force-State-response framework, according to their categorization as driving force, State or response indicators.

III. Main phases and approaches to implementation

A. Phase 1 (May 1995-April 1996)

1. Development of the indicator methodology sheets

9. One of the significant tasks of the first phase was the preparation methodology sheets for each indicator. Building on existing work, a cooperative, consultative and collaborative approach was used to produce the methodology sheets. More than 30 organizations of the United Nations system, other intergovernmental, non-governmental and major group organizations supported this work, assuming lead roles in the drafting of methodology sheets appropriate to their mandate and experience (these agencies are listed in annex I).

10. An expert group, consisting of 45 members of United Nations agencies, other international organizations and non-governmental organizations, guided the overall process of developing the methodology sheets. In addition, approximately 100 individuals with indicator experience from international and national agencies and non-governmental organizations participated in the process by providing advice and comments and contributing their ideas, information and expertise.

11. In February 1996, an international expert workshop on methodologies for indicators of sustainable development was held in Glen Cove, New York, to review the preliminary methodology sheets. Several workshops sponsored by national Governments were also held to further discuss and refine the draft methodology sheets.

12. The collection of methodology sheets was published by the United Nations in August 1996 under the title "Indicators of sustainable development: framework and methodologies". This document, commonly referred to as the "blue book", was distributed to all Governments with the invitation to use and test the indicators and to provide feedback on the results. The goal was to have a more accepted and definitive set of sustainable development indicators by the year 2001.

2. Content of the methodology sheets

13. The methodology sheets contain, inter alia, the following information:

- Basic information on the indicator, including its definition and unit of measurement. In addition, the relevant Agenda 21 chapter and the type of indicator are listed to locate the indicator in the DSR framework;
- Purpose and usefulness of the indicator for sustainable development decision-making (i.e., policy relevance), international targets, where available, and relevant international conventions if the indicator issue is of primary global significance;
- Conceptual underpinnings and methodologies associated with the indicator, including the underlying definitions, measurement methods and a summary of its limitations and alternative definitions;
- Data availability to illustrate the importance of regular data collection and updating to support systematic reporting;
- Listing of the agency or agencies (lead and cooperating) involved in the preparation of the methodology sheets;
- Other information (e.g., contact points, other references and readings).

14. A conscious effort has been made to use a consistent format to frame the contents of the methodology sheets. The methodology sheets were designed to assist countries in the task of developing the priority indicators that are considered most relevant in the context of their sustainable development policies and programmes. The methodology sheets were to form a base and starting point for the process of indicator development, and were understood to be open to enhancement, refinement, amendment and change.

B. Phase 2 (May 1996-January 1998)

1. Training and capacity-building

15. To address the need for building the necessary capacity and knowledge on the use of indicators, a series of briefing and training workshops at the regional level was initiated from November 1996 through June 1997. These were organized by the secretariat of the Commission with the support and cooperation of the Economic and Social Commission for Asia and the Pacific (ESCAP) and the Government of the Netherlands for the Asia and Pacific region; the Government of Costa Rica for the Latin America and the Caribbean region; and the Government of Ghana for the Africa region. The Africa regional workshop was co-sponsored by the United Nations Development Programme (UNDP) Capacity 21 programme.

16. The main objective of all the workshops was to provide an introduction and training in the use of indicators as tools for national decision-making and to explore related methodologies for indicator development. Special attention was given to identifying national priorities and relating them to the process of indicator identification and selection.

17. Several countries followed up on the regional workshops with national training workshops. In the Asia and Pacific region, ESCAP provided seed money for implementation of national training workshops, which were convened in China, the Maldives, Pakistan and the Philippines.

18. During these workshops, a call was made for further capacity-building and technical assistance to secure implementation and follow-up of the programme at the national level. In response, the Division for Sustainable Development of the United Nations Secretariat supplemented its capacity-building activities by the provision of technical support to developing countries that had requested assistance for specific activities, including Barbados, China, Ghana, Kenya and Nigeria. The focus of the technical support activities has been twofold: (a) to assess the state of indicator availability and use at the national level, and (b) to propose a plan of action to achieve an increased level of sustainable development indicator development and use, to the extent possible, with linkages to the monitoring of national strategies and action plans for sustainable development.

19. Voluntary "twinning arrangements", recommended by the Commission and the Division's expert group on indicators as a capacity-building instrument, were also established in several countries. These ranged from cooperation among "equal partners", where twinning merely involved sharing of information, and expertise and partnerships, where one country was providing significant technical and

financial support to enable testing to be carried out by its counterpart. These arrangements produced fruitful outcomes for all partners and have been highly encouraged to continue in the future.

2. National testing

20. At its fourth session, in 1996, the Commission encouraged Governments to pilot test, utilize and experiment with the proposed initial set of indicators and related methodologies over a two-to-three-year period. The purpose of the national testing was to gain experience with the use of indicators, to assess their applicability according to national goals and priorities for sustainable development, and to propose changes to the set and its organizational framework.

21. The national testing programme was launched in November 1996, on the occasion of an international workshop on indicators of sustainable development, held in Ghent, Belgium, and hosted by the Governments of Belgium and Costa Rica. The countries attending the meeting reviewed and endorsed the guidelines for national testing. The guidelines essentially provided suggested testing procedures, including modalities for its organization, implementation options, assessment and evaluation methods, institutional support and capacity-building, and reporting requirements.

22. Twenty-two countries covering all regions of the world participated, on a voluntary basis, in the testing process. By regions, the testing countries were:

Regions	*Countries*
Africa	Ghana, Kenya, Morocco, South Africa, Tunisia
Asia and the Pacific	China, Maldives, Pakistan, Philippines
Europe	Austria, Belgium, Czech Republic, Finland, France, Germany, United Kingdom
Americas and the Caribbean	Barbados, Bolivia, Brazil, Costa Rica, Mexico, Venezuela

23. In addition to the official testing countries, a number of countries (Canada, Nigeria, Switzerland and the United States, among others) were affiliated with the process through voluntary sharing of information, participation in meetings and other forms of exchange of expertise. The Statistical Office of the European Communities (Eurostat) prepared a test compilation of 54 sustainable development indicators for the Commission, drawing on statistical data existing within the European Community. This pilot study was produced as an official publication of the European Communities in 1997. Eurostat provided invaluable technical, substantive and financial support throughout the Commission's work programme.

24. Countries were requested to provide periodic reports on the testing phase to the Division for analysis and for circulation to members of the expert group and testing countries. A format for reporting on the progress of national testing was issued in 1997 to facilitate the submission of consistent and detailed information that would allow for a final revision of the indicators and related methodologies. The reports of all the testing countries can be found on the Secretariat web site at *http://www.un.org/esa/sustdev/isd.htm*.

25. Most of the testing countries adopted different approaches to the testing exercise, ranging from plain evaluation of data availability for all or a few selected indicators to embarking on the whole process of developing their own independent set of national indicators while using the Commission indicators as a point of reference. Nevertheless, the majority of the countries aligned their processes with the Commission's testing guidelines, while others integrated the guidelines into their own unique design.

26. All the testing countries employed participatory implementation strategies. This is evident in the respective institutional arrangements chosen by countries as the coordinating mechanism for the testing process. The majority of the countries adopted highly integrated multi-stakeholder strategies involving government ministries, NGOs, academia and relevant business organizations, while others confined the process within government ministries. Annex II lists the various institutional coordinating mechanisms and implementation approaches employed in the different countries.

27. Within these national coordinating bodies, most of the countries also created working groups, expert teams and committees that focused on the indicator work. The formation of an indicator network (for instance, in South Africa and Finland) was also found useful in fostering the integration of ministries and research institutions.

28. Several countries also experimented with "twinning", where two or more countries agreed to either engage in mutual exchange of information and experience in indicator development (e.g., South Africa and Finland) or where one country provided significant technical and financial support to another participating country (France and Tunisia). These arrangements provided an excellent platform for information exchange and sharing of expertise, creating win-win situations with the involved countries achieving a wider knowledge base.

29. Halfway through the implementation of the testing programme, a global meeting of testing countries was hosted by the Government of the Czech Republic in Prague in January 1998. The meeting took stock of the progress in implementation and discussed ways to improve the process and ultimately the results of the programme.

C. Phase 3 (January 1998-December 2000): lessons learned

1. Evaluation of testing results and indicator set

30. The testing phase was officially concluded in December 1999 by an international workshop on the Commission's indicators of sustainable development, hosted by the Government of Barbados and supported by the Government of Germany and the Division for Sustainable Development. This meeting provided the forum for the assessment of the Commission's indicators of sustainable development, their applicability and their usefulness in supporting national decision-making, and served as a venue for the exchange of information at the national, regional and global level on sustainability indicators and their practical use.

31. All relevant information on the testing programme including country reports was compiled and organized into a database, which served as an analytical tool for reviewing testing results, the indicator framework and the working list of indicators.

32. Many countries pointed out that the testing process was, in general, a successful exercise. The highly participatory approach adopted by countries in the testing exercise not only heightened awareness on the value and importance of indicators but also increased levels of understanding on sustainable development issues. Moreover, the testing has reportedly inspired the launching of other indicator initiatives and has tied many players together.

33. In many cases, making use of existing structures, such as national committees or councils for sustainable development, was seen as useful in organizing the national coordinating mechanism. On the other hand, in some countries the testing of indicators acted as a positive catalyst in the establishment of new mechanisms for coordinating both the indicators programmes and the formulation of sustainable development strategies, and has demonstrated the potential of collaboration and cooperation in advancing the goals of sustainable development.

34. The involvement of major groups and stakeholders had been found effective in achieving the full integration of user perspectives in the identification of national sustainable development priorities and corresponding indicators. It has been noted that in many developing countries, NGOs, the private sector and other major groups had already been involved in the national coordinating committees for environment and sustainable development, and their participation gave impetus to the national testing process.

35. It was also noted that when high-level policy makers have been involved and are genuinely committed to sustainable development, the work on indicators progressed more rapidly.

36. Notwithstanding the aforementioned successes, several institutional constraints affected the implementation of the testing, such as limitations on the availability of financial and human resources, difficulty in mobilizing the relevant experts and stakeholders, lack of coordination between statistical agencies and the indicator focal point, low level of awareness among stakeholders, low level of commitment on the part of participating institutions, competing work demands, and government leadership transitions that resulted in discontinuities in the implementation of the indicator process. This called for strengthening capacity-building programmes in the form of human resource and organizational development. A strong human resource base is central to the multi-stakeholder process, as are properly coordinated and highly committed institutional mechanisms.

37. Time as well as financial constraints also affected the testing undertaken in some countries. In view of the

need to go by the rather strict timetables of the testing process, adjustments had to be made on the degree and level of consultations.

38. To be more successful, it was also felt that the indicator programme should be viewed and treated as a more permanent programme that is closely linked with national reporting to the Commission and integrated with the development of national policy.

2. Working list of indicators

39. Testing results showed that sustainable development indicators clearly have potential for assisting in national decision-making. Countries reported to have used or planned to use the indicators to:

- Bring important issues to the political agenda;
- Help to identify main trends in priority sectors;
- Facilitate reporting the state of sustainable development to decision makers and the general public, both domestic and international;
- Promote national dialogue on sustainable development;
- Help to assess the fulfilment of governmental goals and targets, and in the revision of these goals and targets;
- Facilitate the preparation and monitoring of plans;
- Help to assess the performance of both policies and actions when implementing the plans;
- Explain the concept of sustainable development in practical terms;
- Focus the national and sectoral programmes and State budgets towards sustainability.

40. As can be expected, not all of the indicators in the working list were found relevant in the context of a testing country. In selecting the applicable indicators, most countries engaged in a process of prioritizing the indicators using relevant criteria, such as availability and accessibility of data, usefulness and policy relevance. In general, however, the testing countries found the working list to be a good starting point for identifying options from which they could choose national indicators.

41. There was some uncertainty regarding the focus of the indicator set, as to whether it was geared for national use or for international comparison. While testing had been carried out at the national level, it was nonetheless perceived to have an international context, taking into account the mandate of the Commission and the structure and content of the methodology sheets, which describe commonly accepted methodologies, internationally harmonized terminology and internationally compatible classification systems. It was clarified, however, that the primary goal of the indicator programme is to develop a tool to assist national decision-making. On the other hand, it is considered that a good indicator system should be able to reflect the specific issues and conditions of a country or a region but should nevertheless be harmonized internationally to the extent possible.

42. Some countries reflected in their reports the problem of establishing the link between national strategies and the indicators. This was particularly true for countries that had commenced their indicator programmes in the absence of an integrated sustainable development strategy. It is hoped that this will change as more countries develop national sustainable development strategies and the use of indicators of sustainable development gains momentum as a national planning and monitoring tool.

43. Testing countries, however, also felt that improvements could be made both regarding the indicators and the methodology sheets. While the methodology sheets for the indicators were found particularly useful in drawing attention to improving the availability of data for monitoring the implementation of Agenda 21, a call was made for establishing more concrete and clearly defined concepts for the indicators.

44. It was also observed that the working list of indicators was too long, making it difficult to test all the indicators. Furthermore, it was felt that the list attempted to cover too many issues, leading to a very wide scope of testing. Suggestions were made, therefore, to better target the set to key problems or issues. Indicators for a number of emerging problem areas, such as tourism, transportation, cultural heritage and disaster vulnerability, were suggested to be included in the list.

45. Testing countries also proposed to develop indicators to cover areas that had not been addressed in

the testing, such as reef conservation and the health of reef ecosystems and specific coastal issues; energy; biotechnology; trade and environment; safeguarding of cultural heritage; social and ethical values; human resource development; under-employment; expatriate labour force; natural resource accounting; and capacity-building.

46. Most countries, nonetheless, shared the view that the final list of indicators should be short, focused, pragmatic and flexible so that it could be adapted to country-specific conditions.

3. Revising the framework and indicator list

47. Guided by the reports from the testing countries and continuing expert discussions on the indicators and the framework, the Division for Sustainable Development began, in early 1999, the process of defining the appropriate measures to take in the light of the various concerns raised during the implementation of the work programme.

48. At its fifth meeting, in April 1999, the expert group on indicators of sustainable development discussed midstream actions to prepare for the conclusion of the work programme. The group addressed the following issues: inclusion of new areas identified as priorities by the testing countries; deletion of issues less reported on by countries; possible revision of the DSR framework; selection of criteria for the core set of indicators; and advancing the testing in selected countries.

49. While the DSR approach proved extremely useful in organizing the indicators and the testing process as well, the expert group felt that there was a need to refocus the indicator framework to emphasize policy issues or main themes as recommended by a number of countries. It was felt that redesigning the indicator framework in this manner would make the value of indicator use more obvious, and thereby help stimulate increased government and civil society involvement in the use and testing of indicators. Accordingly, a study was undertaken to design a theme-based indicator approach.

50. The resulting organization presents the indicators under four major dimensions, further broken down into themes and sub-themes (see table 1). The determination of the major areas, themes and sub-themes was based on a broad range of information, the major sources of which were the reports of the testing countries and international initiatives that have measured or conceptualized sustainability. The testing reports were analysed to generate the following information: priorities that each country stated in order to achieve sustainable development, the Commission indicators tested (why they tested them and what problems they had in the process), new indicators proposed and the criteria used by each country in the indicator selection.

Table 1
Theme/sub-theme framework for indicators

Dimension	*Theme*	*Sub-theme*	*Indicators*
Social			
Environmental			
Economic			
Institutional			

51. Regarding other major international initiatives on indicator development, every effort was made to work towards convergence between the Commission's efforts and those of other organizations and agencies. Information was therefore analysed to take into account the goals identified by each international initiative and the indicators selected to measure progress towards those goals. It needs to be stressed that the selection of indicators has to be closely related to the goals and objectives of the particular programme.

52. The selection of themes, sub-themes and indicators was further based on the criteria provided for in the national testing. In addition, the following parameters, as offered by Commission testing countries, were used for making the final selection of indicators:

- Useful for decision-making and operable in the real world, have data available, easily understood, simple to use clearly and unambiguously defined; capable of being implemented using the statistical capabilities available in the country;
- Relevant to assess progress towards sustainable development;
- Based on international consensus as far as possible and useful for national reporting at the international level.

53. The revised framework was presented during the Barbados meeting (see para. 30 above), where countries agreed to:

- Maintain the four dimensions of sustainable development indicators as used in the original framework; namely economic, social, environmental and institutional;
- Accept in principle a thematic organization of the framework under the four dimensions and to cross-reference the themes to the related chapters of Agenda 21, thereby maintaining continuity and linkage with the previous chapter-based organization.

54. To further refine the thematic framework and indicators, a small working group of experts was established. The mandate of the working group was to:

- Identify and finalize key themes and sub-themes of sustainable development to be included in the presentation to the Commission at its ninth session;
- Identify core indicators related to the chosen themes and sub-themes, taking into account the national testing reports submitted to the Division for Sustainable Development;
- Prepare recommendations for additional work to be undertaken in order to finalize the substantive presentation on indicators for the Commission, such as areas needing further research, areas for long-term development and unresolved issues, as appropriate.

55. After a comprehensive analysis of the themes put forward during the Barbados meeting (see para. 30 above) and directions provided by the previous discussions of the expert group on indicators, the working group proposed the adoption of 57 indicators categorized under 15 themes and 38 sub-themes. The distribution of the indicators according to the various dimensions are as follows: 18 social; 19 environmental; 14 economic; and 6 institutional. A full description and discussion of these themes and the corresponding set of indicators and methodology sheets are contained in the background document entitled "Indicators of sustainable development: framework and methodologies". They are summarized in table 2.

4. Linkages and aggregation

56. Over the course of the implementation of the work programme, Governments have emphasized the need for aggregated measures of sustainable development or a single index of sustainable development. This concern stems from the desire to use the indicators in a more integrated and holistic manner. Many countries considered the issue of possible linkages and aggregation to be important, and with more time they would be interested to pursue the issue further.

57. In the course of national testing, little time could be devoted to a detailed study of the possible linkages between the social, economic, environmental and institutional dimensions of sustainable development. It was agreed that more work and research is needed both at the national and international levels to address this particular gap. Hence, it was suggested that in the final stage of the work programme on indicators, ways should be explored to address possible aggregation and linkage methodologies applicable to the Commission indicator set.

58. As a first response to this request, the secretariat of the Commission, with the sponsorship of Eurostat and in close consultation with its expert group, launched a study in October 1998 to analyse major initiatives in the area of linkages and aggregation and how these might respond to the focus of phase III. The study aimed to describe and analyse the work on these issues undertaken in recent years by a number of organizations at both the international and national levels. The study covered approximately 30 initiatives by international organizations, research institutes and Governments.

59. Given the results of the initial aggregation study, it was felt that further work in this area should involve relating specific aggregation approaches to the Commission framework, organized by themes and core indicators. A background document is before the Commission, entitled "Initiatives for the aggregation of sustainable development indicators". It outlines the key characteristics of major initiatives and their possible application to the Commission indicator approach.

Table 2
Commission on Sustainable Development theme indicator framework

Theme[a]	*Sub-theme*[a]	*Indicator*
		Social indicators
Equity		% population living below poverty line
	Poverty (3)	Gini index of income inequality
		Unemployment rate
	Gender equality (24)	Ratio of average female wage to male wage
Health (6)	Nutrition status	Nutritional status of children
	Mortality	Mortality rate under 5 years old
		Life expectancy at birth
	Sanitation	% population with adequate sewage disposal facilities
	Drinking water	Population with access to safe drinking water
	Health-care delivery	% population with access to primary health-care facilities
		Immunization against infectious childhood diseases
		Contraceptive prevalence rate
Education (36)	Education level	Secondary or primary school completion ratio
	Literacy	Adult literacy rate
Housing (7)	Living conditions	Floor area per person
Security	Crime (36, 24)	Number of reported crimes per 1,000 population
Population (5)	Population change	Population growth rate
		Population of urban formal and informal settlements
		Environmental indicators
Atmosphere (9)	Climate change	Emissions of greenhouse gases
	Ozone layer depletion	Consumption of ozone-depleting substances
	Air quality	Ambient concentration of air pollutants in urban areas
Land (10)	Agriculture (14)	Arable and permanent crop land area
		Use of fertilizers
		Use of agricultural pesticides
	Forests (11)	Forest area as a % of land area
		Wood harvesting intensity
	Desertification (12)	Land affected by desertification
	Urbanization (7)	Area of urban formal and informal settlements
Oceans, seas and coasts (17)	Coastal zone	Algae concentration in coastal waters
		% of total population living in coastal areas

Theme[a]	*Sub-theme*[a]	*Indicator*
	Fisheries	Annual catch by major species
Fresh water (18)	Water quantity	Annual withdrawal of ground and surface water as a % of total available water
	Water quality	BOD in water bodies
		Concentration of faecal coliform in freshwater
Biodiversity (15)	Ecosystem	Area of selected key ecosystems
		Protected area as a % of total area
	Species	Abundance of selected key species
		Economic indicators
Economic structure (2)	Economic performance	GDP per capita
		Investment share in GDP
	Trade	Balance of trade in goods and services
	Financial status (33)	Debt to GNP ratio
		Total ODA given or received as a % of GNP
Consumption and production patterns (4)	Material consumption	Intensity of material use
	Energy use	Annual energy consumption per capita
		Share of consumption of renewable energy resources
		Intensity of energy use
	Waste generation and management (19-22)	Generation of industrial and municipal solid waste
		Generation of hazardous waste
		Generation of radioactive waste
		Waste recycling and reuse
	Transportation	Distance travelled per capita by mode of transport
		Institutional indicators
Institutional framework (38, 39)	Strategic implementation of sustainable development (8)	National sustainable development strategy
	International cooperation	Implementation of ratified global agreements
Institutional capacity (37)	Information access (40)	Number of radios or Internet accounts per 1,000 population
	Communication infrastructure (40)	Main telephone lines and cell phones per 1,000 population
	Science and technology (35)	Expenditure on research and development as a % of GDP
	Disaster preparedness and response	Economic and human loss due to natural disasters

[a] Numbers in parentheses refer to the corresponding chapters of Agenda 21.

D. Proposals for action and recommendations for future work

60. The principal recommendations with respect to the work programme of the Commission are contained in the main body of the report on chapter 40 (E/CN.17/2001/4).

61. The invaluable work, support and contributions made by sponsoring and testing countries, relevant agencies of the United Nations system, non-governmental organizations, private institutions and many individual experts is gratefully acknowledged. It is strongly recommended that the kind of cooperation and collaboration that has characterized the implementation of the Commission's work programme on indicators be sustained into the future to further assist those countries who wish to incorporate the use of indicators into their own policy-making processes.

Annex I

Cooperating agencies in the development of methodology sheets

United Nations and United Nations affiliates

Secretariat of the International Strategy for Disaster Reduction

Intergovernmental Forum on Forests secretariat

United Nations Statistics Division

Population Division

United Nations Framework Convention on Climate Change

United Nations Conference on Trade and Development

Sustainable Energy and Environment Division of the United Nations Development Programme

Office to Combat Desertification and Drought of the United Nations Development Programme

Division of Environment Information and Assessment of the United Nations Environment Programme

Basel Convention on the Control of the Transboundary Movements of Hazardous Wastes and Other Wastes and their Disposal (United Nations Environment Programme)

Secretariat of the Convention on Biological Diversity

Mediterranean Action Plan (United Nations Environment Programme)

Economic Commission for Europe

Economic and Social Commission for Asia and the Pacific

Economic Commission for Latin America and the Caribbean

Economic Commission for Africa

Economic and Social Commission for Western Asia

United Nations Office for Drug Control and Crime Prevention

United Nations Centre for Human Settlements

International Labour Organization

Food and Agriculture Organization of the United Nations

United Nations Educational, Scientific and Cultural Organization

World Health Organization

World Bank

International Telecommunication Union

United Nations Industrial Development Organization

International Atomic Energy Agency

Intergovernmental organizations

European Commission

European Environment Agency

Statistical Office of the European Communities

World Conservation Union

Organisation for Economic Cooperation and Development

Non-governmental organizations

Environmental Information and Policy

International Center for Tropical Agriculture

International Institute for Sustainable Development

New Economics Foundation

Finnish Environmental Institute

SCOPE-Charles University Environmental Centre

Development Observatory, University of Costa Rica

World Resources Institute

World Wide Fund for Nature International

Wuppertal Institute for Climate, Environment and Energy

Other (international) organizations

National Institute of Public Health and the Environment

World Conservation Monitoring Centre

Government institutions

Federal Planning Office (Belgium)

Environment Canada (Canada)

Institut français de l'environnement (France)

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany)

Interagency Working Group on Sustainable Development Indicators, Executive Office of the President (United States)

Annex II

National arrangements for testing

Region country	*Institutional arrangements*
Africa	
Ghana	A national committee on sustainable development indicators was formed involving all types of stakeholders, including NGOs. UNDP was also involved.
Kenya	The Ministry of Planning and National Development, in collaboration with other sectors, led the national development of indicators.
South Africa	The national committee on sustainable development served as the national coordination mechanism for the testing. Mainly national government departments have been involved, although NGOs, scientific community, and data collection agencies had been approached. Task groups were formed to test indicators by categories.
Asia and the Pacific	
China	A leading group was established, consisting of the national environment protection agency and the state statistics bureau; also, an expert group was established, involving research and educational institutions.
Maldives	The Ministry of Environment was responsible for the testing, in collaboration with a working group comprising ministries and institutions, tourism and trade associations and NGOs. ESCAP provided assistance.
Philippines	A task force of members from government ministries (including statistical agencies), NGOs, academe and the private sector was created to oversee the testing initiative, under the auspices of the multi-stakeholder national council for sustainable development. The committee on social and economic dimensions of the national council has the mandate to review and endorse the results of the testing process. ESCAP provided assistance.
Europe	
Austria	The Ministry of Environment coordinated the testing with the support of federal environment agency and statistical office. The national council for sustainable development consisting of relevant stakeholder groups, including NGOs , commented on the indicators.
Belgium	The inter-ministerial conference on the environment established a working group for the testing involving regional and federal environment ministries and federal planning bureau. NGOs and scientific community are not directly involved but can comment and have shown an interest in being more involved.
Czech Republic	The Ministry of Environment, a university environmental centre and an ecological institute led the testing; an expert group was also set up.
Finland	A working group, with representatives of various ministries, research statistics and environment institutes, coordinated the testing under the national commission on sustainable development.

Region/country	Institutional arrangements
	From early 1998, local authorities and NGOs have also participated. Seminars have been arranged for wider participation and comments. The work was organized by the Ministry of Environment, in collaboration with an institute for environment.
France	Two working groups carried out the testing: a technical group involving 50 statistical and data experts, and a political group with 100 members from the national commission on sustainable development, an inter-ministerial group, the scientific community and NGOs. The Ministry of Environment coordinated the work, while an institute for environment served as the focal point.
Germany	A team involving the environmental administration and statistical office organized the testing, and an inter-ministerial working group coordinated it. A national indicator committee ensured the inclusion of interests of the stakeholders, including NGOs and local communities. A scientific expert team provided advice.
United Kingdom	Existing bodies dealing with national indicators are used for the Commission indicators exercise. They include a government round table on sustainable development and an indicators working group. The process involved stakeholders, including NGOs and local authorities.
Americas and the Caribbean	
Barbados	A steering committee was established to carry out the testing under the national sustainable development commission.
Bolivia	No information is provided on the partners involved in the testing.
Brazil	The Ministry of Environment coordinated the testing.
Costa Rica	No information is provided on the partners involved in the testing.
Mexico	Jointly between the national institute of ecology, under the Ministry of Environment, Natural Resources and Fisheries, and the national institute of statistics, geography and informatics.
Venezuela	An environmental statistics and information centre acted as the focal point for the testing.

Annex III

List of international and expert meetings

Ghent, Belgium 9-11 January 1995	First workshop on indicators of sustainable development for decision-making, hosted by the Governments of Belgium and Costa Rica, UNEP and the Scientific Committee on Problems of the Environment
New York 14 and 15 February 1995	First expert group meeting on indicators of sustainable development, hosted by the Division for Sustainable Development in cooperation with the United Nations Statistics Division
Glen Cove, New York 6-8 February 1996	Expert workshop on methodologies for indicators of sustainable development, hosted by the Environment Agency of the Government of Japan in cooperation with the Division for Sustainable Development
New York 25 and 26 July 1996	Second expert group meeting on indicators of sustainable development, hosted by the Division for Sustainable Development
Geneva 23 September 1996	Third expert group meeting on indicators of sustainable development, hosted by the United Nations System-wide Earthwatch in cooperation with the Division for Sustainable Development
Ghent 20-22 November 1996	Second international workshop on launching the testing of sustainable development, hosted by the Governments of Belgium and Costa Rica
Bangkok 26-29 November 1996	ESCAP regional consultative meeting on environmentally sound and sustainable development indicators, hosted by ESCAP in cooperation with the Government of the Netherlands and the Division for Sustainable Development
San José, Costa Rica 10-12 March 1997	Regional workshop on indicators of sustainable development for Latin America and the Caribbean, hosted by the Government of Costa Rica in cooperation with the Division for Sustainable Development
Accra 3-6 June 1997	Regional workshop on capacity-building in developing and implementing indicators of sustainable development, hosted by the Division for Sustainable Development and the UNDP Capacity 21 programme
New York 23 and 24 October 1997	Fourth expert group meeting on indicators of sustainable development, hosted by the Division for Sustainable Development
Prague 19-21 January 1998	Fourth international workshop on indicators of sustainable development, hosted by the Government of the Czech Republic supported by the European Commission

New York 7 and 8 April 1999	Fifth expert group meeting on indicators of sustainable development, hosted by the Division for Sustainable Development
Barbados 7-9 December 1999	Fifth international workshop on Commission on Sustainable Development indicators of sustainable development, hosted by the Government of Barbados, supported by the Government of Germany and the Division for Sustainable Development
New York 6-9 March 2000	Meeting of the consultative group to identify themes and core indicators of sustainable development, hosted by the Division for Sustainable Development
Quebec 25-28 September 2000	International expert meeting on information for decision-making and participation, hosted by the Government of Canada, the Department of Economic and Social Affairs and UNEP
Bangkok 16-19 October 2000	Regional consultative meeting on indicators of sustainable development in Asia and the Pacific, hosted by ESCAP

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International cooperation for an enabling environment for sustainable development

Report of the Secretary-General

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I. Introduction

1. Agenda 21 calls on the international community to provide a supportive international climate for achieving environment and development goals.[1] Similarly, the Programme for the Further Implementation of Agenda 21, which was adopted by the General Assembly in 1997, calls for a dynamic and enabling international economic environment supportive of international cooperation, particularly in the fields of finance, technology transfer, debt and trade (see resolution S-19/2, annex, para. 25). It also noted that, as a result of globalization, external factors have become critical in determining the success or failure of developing countries in their national sustainable development efforts.

2. The term "enabling environment for sustainable development" is not clearly defined either in Agenda 21 or in the Programme for the Further Implementation of Agenda 21. In the context of the present report, consideration of the enabling environment for sustainable development focuses on the impact on sustainable development of major changes in the world economy due to globalization, as well as on national conditions affecting sustainable development.

3. The present report consists of two main sections. Section II addresses the impact of globalization on sustainable development and related policy implications, with particular relevance to developing countries. In view of the fact that trade and finance, supported by technological advances in information and communication, are the areas where globalization manifests itself most profoundly, section II gives particular attention to these areas. Section III addresses approaches and initiatives in international cooperation to facilitate the transition to sustainable development in the context of globalization.

4. Finally, some conclusions and recommendations are provided to facilitate the discussion on this theme in the Commission on Sustainable Development. They could also prove useful in addressing the issue of globalization and sustainable development in the work of the Commission beyond 2002. The present report should be read in conjunction with the report of the Secretary-General to the Preparatory Committee for the High-level International Intergovernmental Event on Financing for Development (A/AC.257/12).

II. Impact of globalization on sustainable development

5. Globalization has, in principle, the potential to lead to economic convergence among countries. However, the recent period of rapid globalization has seen an increase in inequality among countries and to some extent within countries. This is due primarily to the fact that globalization has not been fully global. While some developing countries, particularly in East Asia, have successfully taken advantage of opportunities for export-oriented growth in the context of globalization, other developing countries, particularly the least developed countries, have not participated in globalization, and many have experienced low growth or recession.

A. Recent developments in finance, trade and technology

6. Net foreign direct investment (FDI) flows to developing countries grew steadily through the 1990s to reach $126 billion in 1999, up from about $20 billion in 1990 (see A/55/187, table). FDI flows, however, remained highly concentrated. Ten developing countries received 80 per cent of total FDI flows to the developing world, and there is no indication that that concentration is declining.

7. While FDI flows to developing countries have grown steadily, portfolio investment flows and bank flows have shown great volatility. Net portfolio investment in developing countries reached a peak of $90 billion in 1994 and then fell to almost nothing in 1998 before recovering somewhat in 1999 (see A/55/187, table). Other private flows to developing countries, primarily bank lending, have fluctuated from net inflows of about $70 billion in 1991 to net outflows of $36 billion in 1994, then again to inflows of $80 billion in 1995 and finally to outflows of $77 billion in 1999 (see A/55/187, table). This volatility of financial flows is clearly an obstacle to sustainable development in developing countries.

8. Trade is an important factor in economic growth and sustainable development, and export-oriented development strategies have become the dominant development strategies in recent years. Benefits from expanding trade through trade liberalization can include increased investment, trade-related fiscal

revenues, and employment and income growth. Increased trade can also contribute to social development and poverty alleviation, primarily through economic growth. However, trade liberalization can also create negative impacts for certain groups, and trade reforms can exacerbate poverty temporarily. In these instances, policy intervention is necessary to alleviate the hardships and facilitate adjustments.

9. Since the mid-1980s, international trade has been expanding at almost twice the pace of total economic activity. Combined global merchandise and service exports now amount to over $6 trillion a year and over 20 per cent of world gross national product (GNP).[2] The rapid increases in global trade and increased emphasis on the role of trade in development have led to expanded and strengthened international trade arrangements, in particular through the World Trade Organization (WTO). At the same time, economic growth, resulting in increased environmental impacts and concerns, has led to new and strengthened multilateral environmental agreements, addressing climate change, protection of the ozone layer, biodiversity, desertification and other issues. These international trade arrangements and environmental agreements are important elements of the international enabling environment for sustainable development but they contain very few provisions or mechanisms for harmonizing trade and environmental issues. The WTO Committee on Trade and Environment addresses such issues, but progress has been limited. How best to ensure that international trade arrangements and environmental agreements are complementary and supportive of sustainable development remains an open question.

10. The increased emphasis on the role of trade in development makes trade and the multilateral trading system a critical element of the enabling environment for sustainable development. Trade liberalization and market access for products from developing countries and assistance to countries seeking integration into the world trade system is of particular importance, in particular for the least developed countries.

11. Perhaps the most important catalyst for increasing globalization is the spread of information and communication technology. This is particularly clear in the operation of financial markets, where the speed and performance of information technology have become critical to market activities. The importance of information and communication technology for full participation in the world economy was underscored by the Economic and Social Council, which adopted this topic as the theme for the high-level segment of its substantive session in 2000.

12. The use of the Internet for soliciting bids for business-to-business transactions, as well as for e-commerce retailing, has expanded enormously in the last few years. Opportunities in these rapidly growing areas are open to enterprises that are "wired" into global information and communication systems, particularly the Internet, as well as private corporate networks. Information and communication technologies thus offer new opportunities for rapid economic growth in high-value products and services, formal sector employment opportunities and economic production with low environmental impacts (for further details, see A/55/381).

13. A large and increasing proportion of trade now takes place between enterprises as part of global production systems and supply chains. Distributors and retailers increasingly want delivery of custom products on a "rapid response" basis. Trade in services, including financial, administrative and information services, is growing rapidly and opens up opportunities for developing countries to engage in the global economy. Small island developing economies, with limited opportunity for manufacturing exports, have successfully developed international service enterprises, such as for information processing and software development.

B. Policy implications

14. National policies are strongly influenced by policies elsewhere. Liberalization and integration processes have affected the autonomy of national policy-making. Economic development in one part of the world affects, in greater or lesser degree, development in other parts of the world. Decisions in larger economies clearly impact more on smaller economies. But crises in developing countries or countries with economies in transition can also affect economic decisions in developed countries. There is an increasing demand for coordinated macroeconomic policy management of the world economy, responsive to the pattern of global development and mindful of equity and sustainability.

15. Globalization has revealed a mismatch between current systems and institutions of national regulation and accountability and the global nature of economic and financial operations. It has posed a challenge to economic governance in terms of a greater responsibility of Governments for the operations of the market and their social and environmental implications. The call for reform of the international financial architecture is a reflection of this situation.

16. The private sector has emerged as a global actor that has a growing role to play in sustainable development through its investment and technology decisions. Apart from being a catalyst for development, the private sector is increasingly challenged to exercise corporate social responsibility to close the gap between global markets and national communities. The Secretary-General's Global Compact is one initiative intended to promote global corporate social responsibility.

17. It has become essential to establish partnerships between state and non-state actors which stress the complementary roles of Governments, markets and communities in sustainable development. Policy makers are realizing that the sentiments of civil society at large include aspirations for accountable governance, democratic practices and a translation of economic gains into more socially just societies. Communities are becoming more "aggressive" in challenging the ways in which sustainable development is being planned and realized. The challenge for Governments is to transform this "social energy" into a driving force for collaboration in the design and implementation of sustainable development objectives.

III. Approaches and initiatives in international cooperation for promoting sustainable development in the context of globalization

18. Globalization has created a new impetus for international cooperation and policy dialogue to facilitate the transition to sustainable development. Answers have to be found to the question of how to manage the global economy in the context of globalization so as to advance economic growth and sustainable development in all countries and spread the benefits of globalization more widely. Complementarity in development assistance programmes needs to be increased and partnerships built between state and non-state actors, in particular the private sector.

A. International cooperation in the areas of finance, trade and technology

19. Private financial flows to developing countries, in particular FDI, strengthen the enabling environment for sustainable development. For some developing countries, particularly middle-income countries, private financial flows are the largest source of external finance for sustainable development. Private financial flows, particularly FDI, generally contribute to sustainable development not only through financial investment but also through the transfer of cleaner, more productive and resource efficient technologies and management systems and through access to foreign markets. The increasing tendency of transnational corporations to establish global standards for environmental performance enhances the contribution of FDI to sustainable development.

20. Despite the large growth in private capital flows, there is a an essential role for official development assistance (ODA) in development cooperation to address infrastructure development, social services, environmental protection and capacity-building, in particular in the least developed countries and other developing countries that have been bypassed by FDI. Between 1992 and 1997, total ODA from developed to developing countries, bilaterally and through multilateral institutions, fell steadily from an average of 0.33 per cent of donor country GNP as a whole to 0.22 per cent, far below the United Nations target level of 0.7 per cent of GNP. In 1998, there was a reversal of this trend, with ODA increasing to 0.23 per cent of GNP for 1998 and 0.24 per cent for 1999.[3] Part of this recent increase is expected to be transitory, but part of it reflects a commitment by some donor countries to increase their aid flows.

21. There have also been changes in the way in which ODA is allocated. During the 1990s, some assessments of aid effectiveness concluded that aid was effective in some national policy environments but not in others. As a result, there have been sharp cuts in ODA to some countries, but only modest cuts to those whose policies were considered by donors to be more conducive to aid effectiveness. A number of countries experienced cuts

of at least 50 per cent in aid per capita between 1990 and 1998.[4]

22. In addition to the changes in overall ODA and allocations among countries, there have also been changes in the sectoral allocation of ODA, in particular to critical areas of sustainable development. The shares of ODA allocated to environmental protection, basic social services and capacity-building approximately doubled from 1990 to 1998 from both bilateral and multilateral sources, with a consistent rising trend over the period. Nonetheless, in 1998 the combined share for those two categories was under 12 per cent of total bilateral commitments and below 8 per cent of multilateral commitments.[5]

23. A necessary component of international cooperation for an enabling environment is a lasting solution to the problem of international debt (see A/55/422). Unsustainable debt has been recognized for some time by the international community as a constraint on the ability of poor countries to pursue sustainable development. In its decision 8/5, the Commission on Sustainable Development urged creditor countries and international financial institutions to implement speedily the enhanced heavily indebted poor countries (HIPC) initiative. It also urged HIPC countries to develop national poverty strategies in a participatory way so that debt relief would be linked with poverty eradication. It further stated that the debt-relief programme should form part of a comprehensive macroeconomic framework to facilitate the release of substantial resources for financing for development and to enable debtor countries not to fall back into arrears.

24. As of December 2000, of the 37 HIPC countries identified as having unsustainable debt, 13 countries have been approved for debt relief under the enhanced HIPC initiative. There are nine additional countries with debt relief programmes under preparation, for which approval is expected by the end of 2000 or shortly thereafter.[6]

25. There are several challenges faced by the enhanced HIPC initiative. Many additional countries still need to be reviewed and programmes prepared; the principle of additionality of resources for the HIPC programme will need the strong support of all donors; and paying for the initiative presents difficulties for some creditor participants.

26. A major challenge is the development and design of effective poverty-reduction programmes in the participating countries. Debt relief under the initiative is linked to recipient countries' preparation of a comprehensive poverty reduction strategy, based on rapid, sustainable growth and improvements in social services. Preparing such a comprehensive, country-owned strategy takes time and resources.

27. Effective transfer of cleaner technologies requires improvements in the matching of donor interests and conditions with the needs of developing countries. Current programmes of international cooperation for technology transfer are often supply driven, with donor countries or agencies funding projects that fit particular programmatic goals. Often, insufficient attention is given to assessing the overall, long-term economic, social and environmental benefits of technology transfer projects. In particular, when the criteria of assistance programmes are defined in narrow environmental terms, the economic viability and competitiveness of investments may be neglected, resulting in inefficient use of resources.

28. It is therefore important that donors and developing countries make concerted efforts to ensure that international assistance for technology transfer is demand driven, supporting investments that promote long-term sustainable development. Developing countries should identify priority sectors and industries in which technology transfer will produce the greatest long-term benefits in economic growth, social development and environmental protection. Once these national priorities are established, sources of finance should be flexible in responding to them.

29. In its decision 6/3, the Commission encouraged Governments of developing countries and countries with economies in transition to develop, with the support of the United Nations system, national strategies for technology innovation, commercialization and diffusion, taking fully into account the need to create an enabling environment for private sector activities.[7] In response to the decision, the Department of Economic and Social Affairs, in cooperation with the United Nations Industrial Development Organization and the United Nations Environment Programme (UNEP), have developed an initiative on national cleaner technology strategies.

30. The objective of this initiative is to develop guidelines and manuals to assist Governments in

developing national technology strategies and in initiating national and international public-private partnerships for the implementation of those strategies. The initiative focuses on the identification of high-potential sectors, based on national conditions and international markets, and of cleaner technologies that can improve both productivity and environmental performance. Preliminary assessments undertaken in the context of the initiative indicate that countries with policy frameworks that encourage cleaner and more resource-efficient production have generally shown better economic performance.

31. Under the United Nations Framework Convention on Climate Change, the Global Environment Facility provides grant and concessional funding to cover the incremental costs of promoting climate-friendly technologies, including the transfer of technology. The clean development mechanism under the Kyoto Protocol could provide a source of finance and technical assistance for the transfer of technologies that increase energy efficiency, once the Protocol has entered into force. Through the mechanism's capacity-building initiatives, the United Nations Development Programme (UNDP) helps to build developing countries' capacities to benefit from investment opportunities for sustainable development while meeting climate change objectives.

B. Supporting countries in the development of national sustainable development strategies and other national development frameworks

32. The Programme for the Further Implementation of Agenda 21 refers to national sustainable development strategies as important mechanisms for enhancing and linking national capacity so as to bring together priorities in social, economic and environmental policies. It sets as a goal the formulation and elaboration of such strategies in all countries by the year 2002, with assistance provided, where appropriate, through international cooperation. International cooperation can facilitate the formulation and elaboration of the strategies by playing a catalytic role in the national process of integration, consultation, participation and capacity-building.

33. National sustainable development strategies provide an opportunity to put into practice common principles of strategic planning for sustainable development. They can mobilize and focus investment for sustainable development through the introduction of a mix of policies that include regulatory measures, economic instruments, information programmes, and voluntary public-private cooperative programmes. They can also become an important instrument for opening up new opportunities for enhancing development cooperation with bilateral donors and multilateral development assistance agencies.

34. National sustainable development strategies aspire to certain principles, in particular a participatory process for integrating economic, social and environmental priorities. Such principles are already being applied in a number of developing countries, building on existing country-level frameworks, such as national conservation strategies, national environment action plans, national visions and national agenda 21s.

35. The Organisation for Economic Cooperation and Development (OECD)/Development Assistance Committee (DAC) has launched an initiative to assist developing countries in the development of national sustainable development strategies through a partnership approach. The OECD/DAC Working Party on Development Cooperation and the Environment has mandated a task force, co-led by the European Commission and the United Kingdom of Great Britain and Northern Ireland, to provide guidance on best practice for assisting developing countries in the formulation and implementation of national sustainable development strategies processes. A scoping workshop in November 1998 brought together members of the task force and representatives of developing countries to discuss the broad directions for the implementation of this initiative. The workshop recommended a systematic in-country consultation with developing country partners in order to develop good practice for donors. The February meeting of the Working Party endorsed the recommendation for informal consultations in a number of developing countries and regions, involving donors and a range of stakeholders. The consultations would review experience with national sustainable development strategies and examine how donors can best assist developing countries in the process of formulating them. The consultations would also contribute to the development of generic guidance for donors as well as donor coordination in the participating countries.

36. The Department of Economic and Social Affairs, in cooperation with UNEP, regional commissions and regional development banks, organized a series of regional consultations on national sustainable development strategies, which identified their key characteristics. The consultative meetings recognized the diversity of approaches to planning and implementing sustainable development. It was also recognized that the process of strategy formulation could be an important mechanism for sectoral integration and community involvement if carried out with the full participation of civil society and the governmental agencies concerned. The primary emphasis should be on the countries concerned coordinating and implementing strategies, plans and programmes in a reasonable time frame.

37. In recognition of the importance of national enabling environments for development and the need for integrated, participatory approaches to development, a number of development assistance agencies have developed programmes for assisting countries in the formulation of broad development policy frameworks and strategies. The United Nations has formulated the United Nations Development Assistance Framework (UNDAF) approach, based on common country assessments, to bring greater coherence to the United Nations programmes of assistance at the country level, in cooperation with Governments and in consultation with other members of the donor community. UNDAF includes consideration of human rights, food security, environmental sustainability, population, gender equality, poverty eradication, governance, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and the promotion and protection of children's rights.

38. The World Bank is developing, in pilot form in 11 countries, the comprehensive development framework approach, based on the principles of country ownership, in partnership between government, civil society, assistance agencies and the private sector. The approach is a long-term vision of needs and solutions built on national consultations and an integrated approach to macroeconomic, financial, structural, social and environmental concerns. In addition, the World Bank and the International Monetary Fund (IMF) have developed the poverty reduction strategy approach as a basis for World Bank and IMF concessional assistance to low-income countries, with an initial focus on debt relief under the HIPC initiative. The development of national poverty reduction strategy papers in the initial countries has identified important poverty-environment linkages that need to be addressed for effective poverty reduction, including improving the health of poor people through improved sanitation, conserving water and biomass resources for sustainable livelihoods in rural areas, protection of rangelands from overgrazing, and conserving soil fertility and agricultural productivity.

39. The substantial human and institutional resources required for the formulation of national sustainable development strategies and other country-level development frameworks may impose a burden on developing countries, particularly the least developed countries. There is a particular need for international organizations to adopt a consistent approach in promoting the formulation of national development strategies and frameworks in developing countries. Capacity-building for participatory consultations, priority-setting and needs assessment, cross-sectoral integration and sustainable development planning are an essential part of the process. In this regard, the UNDP/capacity 21 programme has assisted developing countries in capacity-building in the area of national sustainable development strategies in more than 40 countries.

40. One of the risks of international cooperation in broad strategy formulation, with the explicit or implicit promise of support for implementation, is that the process can become donor driven. The formulation of strategies acceptable to donors can become a requirement for assistance, or can be seen as a source of potential projects from which donors can choose. This can result in a lack of national commitment and motivation, and even opposition on the part of developing country participants. It is therefore important that the role of donors in this area be that of support and facilitation.

C. Recent initiatives at the level of the United Nations

41. The Global Compact initiative launched by the Secretary-General is a partnership between the United Nations, the business community, international labour and civil society organizations. The Compact's main goal is to sustain a global commitment to open markets while meeting the socio-economic needs of the world's

people and contributing to a more humane world. The Compact asks corporations to adopt, in their global operations, good practices identified by the broader international community, in the areas of human rights, labour standards and the environment.

42. The nine principles promoted by the Global Compact are taken from the Universal Declaration of Human Rights, the International Labour Organization's fundamental principles on rights at work, and the Rio Declaration on Environment and Development — all of which enjoy universal political support and a strong international legal foundation. The Global Compact's labour and civil society partners lend their expertise and support to designing and implementing this undertaking.

43. Specifically, corporations are asked to: (a) become public advocates for the Global Compact in their corporate mission statements and annual reports, (b) post on the Global Compact web site steps that they are taking to give concrete expression to the nine principles of the Compact, and (c) join with the United Nations in partnership projects either at the policy level or at the operational level. At the policy level, this might be a structured dialogue on the role of the corporations in zones of conflict. At the operational level, it might be providing Internet connectivity in places like rural Africa or South Asia.

44. Information and communication technology can be a powerful tool for human resource development, poverty alleviation, promotion of sustainable livelihoods, empowerment of the underprivileged and excluded, and enhancing responsible governance. However, unless explicit policies and strategies are implemented to ensure equitable distribution and universal access, the use of information and communication technology tends to widen the gap between developed and developing countries and between rich and poor.

45. The Information and Communication Technologies Advisory Group was established by the Secretary-General to assist in bridging the digital divide between developed and developing countries and harnessing the potential of technology for the development of all. The Group brings together experts from international agencies, Governments and private businesses and foundations of both developed and developing countries. The Group is charged with drawing up modalities for the Information and Communication Technologies Task Force on the basis of guidelines set by the Economic and Social Council.

46. In the area of finance, in its resolution 54/196, the General Assembly decided to convene the high-level international intergovernmental event on financing for development, involving political decision makers at least at the ministerial level. The event will be an unprecedented collaboration between the United Nations, the World Bank, IMF and WTO to find innovative ways to address the many issues affecting the financing of development.

47. The event will consider national, international and systemic issues relating to financing for development in a holistic manner in the context of globalization and interdependence, and will address the mobilization of financial resources for the full implementation of the action plans agreed to at major United Nations conferences of the 1990s. In so doing, the high-level event could capitalize on the work of the Commission in the area of finance for sustainable development.

IV. Conclusions and recommendations

48. Understanding the links between globalization and sustainable development is essential to more integrated and strategically focused policy-making. It allows Governments, international organizations and other stakeholders in the development process to make proactive adjustments to changing conditions in the enabling environment for sustainable development at the national level and through international cooperation.

49. Globalization has created a new impetus for international policy dialogue to promote sustainable development in all countries. Much of this dialogue is currently taking place in an issue- or sector-specific context or in international technical forums. It is, therefore, important to focus the deliberations in the Commission related to international cooperation for an enabling environment on integrated policies and strategic approaches to maximize the benefits of globalization and minimize its risks in the transition to sustainable development. The deliberations on this theme should also provide an opportunity to explore feasible ways of donor coordination in development assistance and the building of new partnerships for sustainable development.

50. Multilateral and bilateral development assistance agencies should work towards strengthening their coordination in responding to the strategic planning demands of developing countries in the formulation and elaboration of their national sustainable development strategies. Coordination is also needed in the development and implementation of development assistance frameworks, such as UNDAF and the World Bank's comprehensive development framework.

51. Regional and subregional cooperation, including South-South cooperation, should be promoted for the further development of national sustainable development strategies and other national development frameworks. Such cooperation should be built on the respective comparative advantages through partnership and networking. Regional cooperation should be strengthened to harmonize macroeconomic and other sustainable development policies; address issues related to transboundary and shared natural resources; harmonize national programmes with efforts at regional and subregional levels; strengthen programmes for sharing technology and information; and enhance the region's common position in global forums.

52. A major component of globalization over the past decade has been the rapid increases in trade. Issues of market access and of the capacity of developing countries to realize the potential benefits of the Uruguay Round of the General Agreement on Tariffs and Trade should continue to be at the centre of trade deliberations.

53. Private international financial flows, particularly foreign direct investment, have the potential to contribute to sustainable development through capital investment, transfer of cleaner technologies and management skills, and access to export markets. International cooperation should be used to promote FDI for sustainable development in developing countries that have been marginalized in the process of globalization in order to ensure that a larger number of developing countries and countries with economies in transition benefit from this form of investment.

54. International cooperation is also needed to promote financial capacity-building to enable developing countries to fully benefit from and be prepared for the challenges to sustainable development arising from increased private international financial flows and globalization. An initiative on financial capacity-building was launched at the Fifth Expert Group Meeting on Finance for Sustainable Development, held in Nairobi in December 1999. As a first set of activities under this initiative, an interregional consultation is planned, with follow-up meetings at the regional and country level and a focus on financial capacity-building to meet the challenges of financial globalization, persistent poverty and environmental degradation.

55. ODA remains essential for sustainable development in developing countries. ODA for sustainable development should be increased with a view to meeting agreed international targets. Better cooperation between donors and recipients is required to ensure that ODA is allocated and used more effectively for sustainable development, including economic development, environmental protection and poverty eradication.

56. Unsustainable debt is a critical constraint on the ability of developing countries to pursue sustainable development. Debt relief is therefore an integral part of an international enabling environment for sustainable development. Debt relief under the enhanced HIPC initiative needs to be supported, strengthened and expedited by donors and the international community.

57. Governments, with the support of the United Nations and other development assistance organizations, should develop national cleaner technology strategies to improve economic productivity, conserve natural resources and prevent environmental degradation, focusing on potential growth industries, existing technological capacities, and national and international market opportunities. The strategies should include incentives for cleaner production, training and technical assistance to enterprises, policies to control environmental degradation and promotion of investment in cleaner technologies. In the context of national technology strategies, Governments should promote public-private partnerships, within and between countries, working with industry, research and development institutions and educational institutions, to promote the development and transfer of cleaner technology. The international community can assist developing countries through capacity-building for technology policy, facilitating technology investment and transfer by means of financial and other incentives, and promoting alliances between enterprises in developed and developing countries. The United Nations and other development assistance organizations should

assist developing countries in identifying sources of financing for the transfer of cleaner technology.

Notes

[1] See *Report of the United Nations Conference on Trade and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II, para. 2.3.

[2] See World Bank, *World Development Indicators 2000*.

[3] Based on data accessed at http://www.oecd.org/dac in December 2000.

[4] See World Bank, *Global Development Finance 2000*.

[5] See background paper No. 2, entitled "Financial flow statistics" (DESA/DSD/2000/2).

[6] Based on data accessed at http://www.worldbank.org/hipc on 7 December 2000.

[7] See *Official Records of the Economic and Social Council, 1998, Supplement No. 9* (E/1998/20), chap. I, sect. B, decision 6/3, para. 4 (c).